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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/736,155

12/15/2003

Ronald D. Hatfield

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08/18/2010

USDA-ARS-OFFICE OF TECHNOLOGY TRANSFER  
NATIONAL CTR FOR AGRICULTURAL UTILIZATION RESEARCH  
1815 N. UNIVERSITY STREET  
PEORIA, IL 61604

EXAMINER

PRYOR, ALTON NATHANIEL

ART UNIT

PAPER NUMBER

1616

MAIL DATE

DELIVERY MODE

08/18/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |  |  |
|------------------------------|--------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/736,155 | <b>Applicant(s)</b><br>HATFIELD ET AL. |  |
|                              | <b>Examiner</b><br>ALTON N. PRYOR    | <b>Art Unit</b><br>1616                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5,7,8,10,11 and 14-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,7,8,10,11 and 14-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

Applicant's arguments filed 6/29/10 have been fully considered but they are not persuasive. Previous rejections and other issues not addressed below are withdrawn.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5,7,8,10,11 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatfield (Characterization of red clover polyphenol oxidase, Plant Biology 2002 Program, Session 67, page 164) above in view of Krutz (GB 2019731; 11/7/79). Hatfield teaches a method for preserving forages (fodders) for animal production systems. Red clover silage retains over 80% of its protein (the amount of o-diphenol and polyphenol oxidase reduces the degree of proteolysis by at least 20%). Reduced proteolysis in red clover is connected to the presence of soluble polyphenol oxidase (PPO) and soluble polyphenols such as caffeic chlorogenic acid and phasic acid. Hatfield teaches that red clover extracts containing PPO and o-diphenol.

Hatfield does not teach 1) the specific crops recited in claims 1 and 14, 1) the instant application rates of polyphenol oxidase and o-diphenol compound, 2) the contacting a polyphenol oxidase transformed crop to be ensiled with an o-diphenol compound and 3) the maceration of the crop to be ensiled. Based on Hatfield's teaching, it would have been obvious to treat crop of any type, including those crops

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recited in claims 1 and 14, with a red clover extract in order to prevent protein degradation in the plant. Although Hatfield does not explicitly teach polyphenol oxidase transformed crop, Hatfield teaches the application of polyphenol oxidase to crops to be ensiled. It is obvious that the application of polyphenol oxidase onto crops to be ensiled yields polyphenol oxidase transformed crops. With respect to maceration of forage, Krutz teaches an apparatus for macerating agriculture products to enhance drying (abstract) in a short time period. It would have been obvious to an artisan in the field to have modified the invention of Hatfield to include maceration. The artisan would have been motivated to do this to shorten the drying period of the forage which reduces the possibility of damage to the crop. See abstract, column 1. With respect to application rate of polyphenol oxidase and o-diphenol compound, it is well within the skill of the artisan to determine the most efficient application to ensure the production of healthy forage.

### ***Response to Applicants' Arguments***

Applicants argue that Hatfield teaches that the endogenous PPO and o-diphenol present in red clover inhibits protein degradation. Hatfield does not teach or suggest treating crop material with PPO and o-diphenol as instantly claimed. In addition, Hatfield does not teach treating the specific crops recited in claims 1 and 14. The Examiner argues that Hatfield starts out by explaining that there exists a protein degradation problem in silage production. Hatfield points out that red clover silage retains above 80% of its protein because of its PPO and o-diphenol content. Hatfield teaches that red clover extracts contain PPO and o-diphenol. The Examiner further argues that Hatfield

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at the very start identifies that ensiling is a popular process for preserving forages. The Examiner argues that from Hatfield's teaching it would have been obvious to treat crop of any type, including those crops recited in claims 1 and 14, with a red clover extract in order to prevent protein degradation in crop. For this reason the rejection is maintained.

Applicants argue that Krutz does not alleviate the deficiencies in Hatfield. Hatfield is directed to an apparatus for macerating forage such as hay. The Examiner argues that Krutz discloses an apparatus for macerating agrochemical products (forage) to enhance their drying. The drying step taught by Krutz is the primary reason for adding Krutz to Hatfield. It would have been obvious to an artisan in the field to have modified the invention of Hatfield to include maceration. The artisan would have been motivated to do this to shorten the drying period of the forage which reduces the possibility of damage to the crop. See abstract, column 1.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Telephonic Inquiry***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALTON N. PRYOR whose telephone number is (571)272-0621. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alton N. Pryor/  
Primary Examiner, Art Unit 1616

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